Check List the journal of biodiversity data

NOTES ON GEOGRAPHIC DISTRIBUTION

Check List 15 (2): 249–252
https://doi.org/10.15560/15.2.249

PENSOFT

First record of the Short-tailed Pipefish, *Microphis brachyurus lineatus* (Kaup, 1856) (Syngnathidae, Nerophinae), for Suriname

Timo Moritz[1,2], Philipp Thieme[1,2], Kenneth Wan Tong You[3,4], Jan Mol[3,4]

1 Deutsches Meeresmuseum, Katharinenberg 14-20, 18439 Stralsund, Germany. **2** Friedrich-Schiller-University Jena, Institute for Zoology and Evolutionary Research, Erbertstr. 1, 07743 Jena, Germany. **3** Center for Agricultural Research in Suriname (Celos), Prof. Dr. Ir. J. Ruinardlaan, Paramaribo, Suriname. **4** Anton de Kom University of Suriname, Department of Biology, Leysweg, Paramaribo, Suriname.
Corresponding author: Timo Moritz, timo.moritz@outlook.com

Abstract
The occurrence of the pipefish *Microphis brachyurus* (Bleecker, 1854) in Suriname is reported here for the first time. The records include 3 specimens from the lower Suriname River at Overbridge, collected from a reach in the river with fresh water, without brackish tidal influence and dense aquatic and flooded shore vegetation.

Key words
Neotropics, Opossum Pipefish, South America.

Academic editor: Arturo Angulo | Received 3 December 2018 | Accepted 11 January 2019 | Published 1 March 2019

Citation: Moritz T, Thieme P, You KWT, Mol J (2019) First record of the Short-tailed Pipefish, *Microphis brachyurus lineatus* (Kaup, 1856) (Syngnathidae, Nerophinae), for Suriname. Check List 15 (2): 249–252. https://doi.org/10.15560/15.2.249

Introduction

The taxonomy of *Microphis brachyurus* (Bleeker, 1854) sensu lato is still in flux. Depending on the author, it represents either a single species with 4 subspecies (e.g., Dawson 1984) or 4 species (e.g., Fricke et al. 2018). Until comprehensively investigated, we tentatively follow the last detailed review by Dawson (1984), separating the taxon in 4 subspecies: *Microphis brachyurus brachyurus* (Bleeker, 1854) from the central Indian Ocean and central Pacific Ocean, *M. b. aculeatus* (Kaup, 1856) from the eastern Atlantic Ocean, *M. b. millepunctatus* (Kaup, 1856) from the western Indian Ocean, and *M. b. lineatus* (Kaup, 1856) from the western Atlantic Ocean.

Microphis brachyurus lineatus occurs in brackish waters and freshwater rivers in coastal areas from Brazil to Mexico (Ferraris 2003). It was reported for Guyana by Eigenmann (1912). For French Guyana, records have not been published so far in the scientific literature, but we are aware of a specimen in the ichthyological collections of the California Academy of Sciences (CAS-ICH 238098). The respective specimen was collected (probably in 2015) from the Comte River close to the village Cacao. There are no records of *Microphis brachyurus* reported for Suriname. By collecting 3 specimens in February 2018 from the Para District, we were able to close at least this gap.

Methods

Specimens of *M. b. lineatus* were collected using a small seine of 2 × 1.2 m with 5 mm mesh size. Soon after catching, the specimens were photographed in a small photo tank using a Canon EOS 80D with a SIGMA Macro 105 mm f/2.8 macro lens. Collected fish were euthanized using an overdose of clove oil prior to fixation. The pipefish were either preserved in pure ethanol

Copyright *Moritz et al.* This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

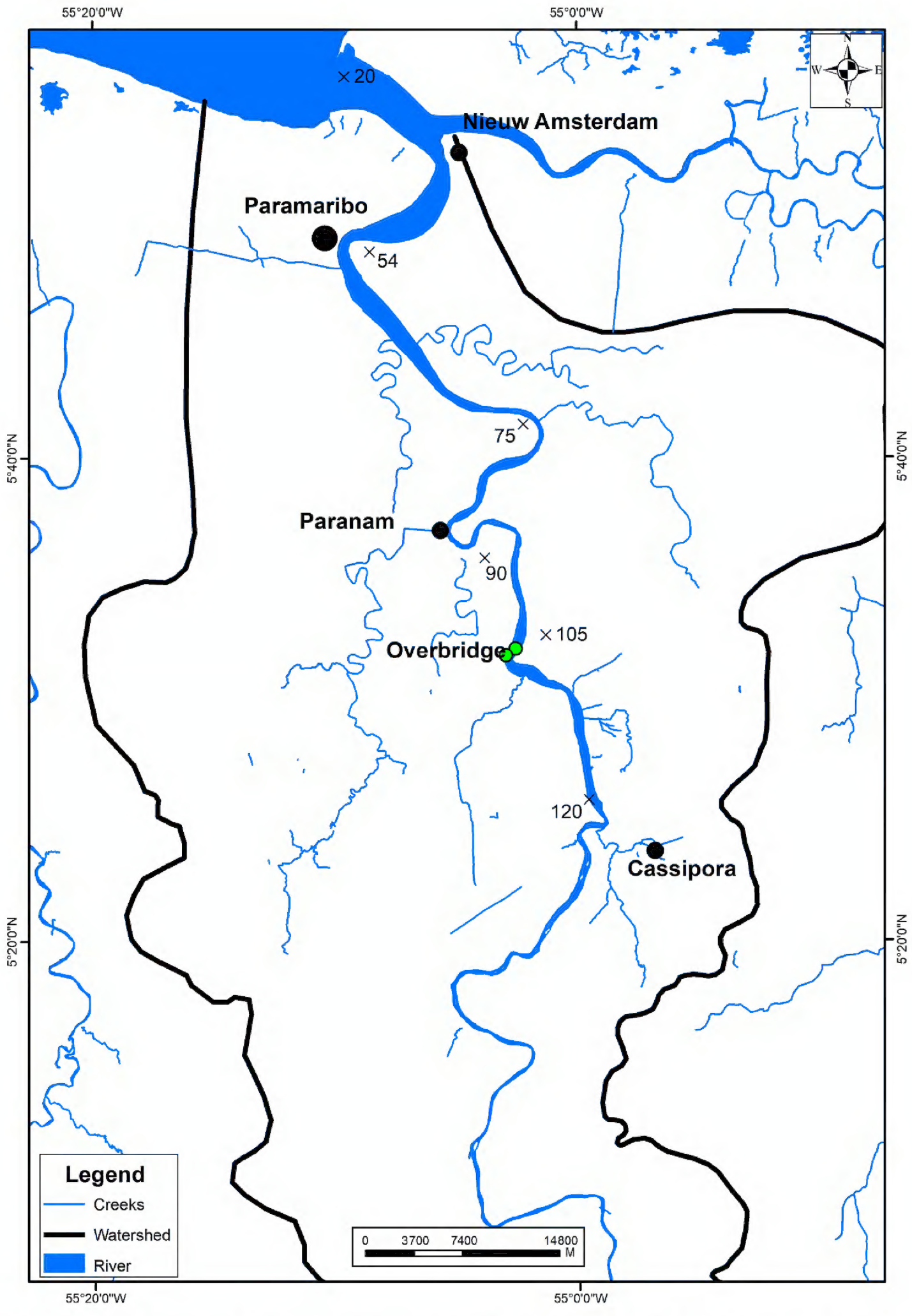

Figure 1. Map of the lower Suriname River, Suriname, showing collection localities of the short-tailed pipefish *Microphis brachyurus lineatus* at Overbridge (at km 105) and the maximum limit of salt water (300 mg/L Cl^-) intrusion at km 90 (Paranam). River kilometer numbers are measured along the thalweg and begin at zero, designated as the river mouth at the 15 m depth contour at low-water spring tide, and increase in upstream direction.

or fixed with 4% formalin and later transferred into 70% ethanol. The specimens are stored in the ichthyological collection of the Deutsches Meeresmuseum, Stralsund, Germany (DMM). Fixed specimens were photographed with the extended focus technique using a Canon EOS 80D with a CANON MP-E 65 mm f/2.8 a-5x macro lens via the dedicated software Canon Utilities; images were stacked with Helicon Focus 7.0 (HeliconSoft, Kharkiv) and stitched with Hugin 2016.2.0 (hugin.sourceforge.net). Cropping without alteration on the specimen was performed using GIMP 2.8.22 (www.gimp.org).

Collecting was performed in cooperation with the Center for Agricultural Research in Suriname (Celos) and Department of Biology, Anton de Kom University of Suriname; part of the samples was exported under the permit #183/18 issued by the Ministry of Agriculture, Animal Husbandry and Fisheries of Suriname.

Results

New records (Fig. 1). Suriname: Para District: lower Suriname River close to Overbridge Resort, at a sand bank in the middle of the river (05°32′05″ N, 055°02′36″

Figure 2. *Microphis brachyurus lineatus*, female, DMM IE/14883, 103.4 mm SL, Suriname River at Overbridge, Suriname, live.

W, at km 105 of river), coll. by T. Moritz, P. Thieme, P. Warth, V. von Vietinghoff & K. Wan Tong You, 12 February 2018 (2 specimens). Suriname: Para District: lower Suriname River, western bank in the southern part of Overbridge Resort (05°31′49″ N, 055°03′00″ W, at km 105 of river), coll. by T. Moritz, P. Thieme, P. Warth, V. von Vietinghoff & K. Wan Tong You, 12 February 2018 (1 specimen).

Live pictures were taken on the day of capture (Fig. 2). All specimens were collected in vegetation; at the sandbank in the middle of the river in flooded stands of *Eleocharis* Brown and *Montrichardia* Crueger (Fig. 3) and submerged *Mayaca fluviatilis* Aublet, and in dense aquatic vegetation, predominantly consisting of *Cabomba* Aublet, along the southwestern bank of the Overbridge Resort. The area in which the specimens were collected is influenced by tidal changes in water level, but the water is fresh (< 300 mg/L Cl) year-round (Fig. 1).

Figure 3. Vegetated sand bank in the middle of the Suriname River close to Overbridge, Suriname, with the emergent aquatic macrophytes *Eleocharis* and *Montrichardia* and submerged *Mayaca fluviatilis*.

Two specimens, both female, were euthanized using clove oil: one specimen was fixed in 100% ethanol (DMM IE/14824, 97.7 mm SL, Table 1), the second specimen was fixed in 4% formalin and later transferred into 70% ethanol (DMM IE/14883, 103.4 mm SL, Table 1, Fig. 4). The third specimen was kept alive and was observed for 1 month in a 45 × 30 × 30 cm aquarium with some artificial plants added for shelter, but no bottom substrate. No other fishes were present in the tank. The *M. b. lineatus* specimen accepted both live *Culex* Linnaeus, 1758 larvae at the water surface and chironomid larvae on the bottom of the tank. However, most of the time the specimen was feeding or resting near the water surface in between the artificial plants and this behaviour is confirmed by observations in the wild in French Guiana where *M. b. lineatus* was observed swimming at the water surface in mangroves (G. Quartarollo personal communication). While *M. b. lineatus* shows a rather surface-oriented behaviour, the second syngnathid in the area, the smaller, syntopic pipefish *Pseudophallus brasiliensis* Dawson, 1974 lives in the benthic zone (Mol 2012b).

Identification. Five species out of 3 genera of pipefish have been recorded from freshwater in South and Central America (Ferraris 2003). The body ridge configuration (Fig. 4) is diagnostic for *Microphis*, with the anterior ridge running ventrally at the level of dorsal fin origin and thus overlapping with the posterior ridge (Dawson 1984: fig. 1). Within this genus, a single species was reported for South America. Furthermore, Dawson (1984) provided a worldwide key for the genus *Microphis*, in which the species keys out as *M. brachyurus lineatus*, by having a distinct longitudinal opercular ridge accompanied by a supplemental ridge, scutella without keel, snout depth 8.1–8.7 times the snout length, snout length 1.62–1.69 times the head length, and 18 trunk rings (Table 1).

Figure 4. *Microphis brachyurus lineatus*, female, DMM IE/14883, 103.4 mm SL, Suriname River at Overbridge, Suriname, fixed.

Table 1. Morphometric data of *Microphis brachyurus lineatus* from the Suriname River deposited in the Deutsches Meeresmuseum and comparative data from 190 specimens presented in Dawson (1979).

Measurements	IE/14883	IE/14824	Dawson (1979)
Standard length (mm)	103.4	97.7	56.5–194
Counts			
Dorsal fin rays	39	42	37–54
Pectoral fin rays	20	19	17–23
Trunk rings	18	18	17–21
Tail rings	22	20	20–26
Subdorsal trunk nodes	1.5	2.5	1.5–4.0
Subdorsal tail nodes	5.25	5.5	4.0–8.25
Total subdorsal nodes	6.75	8.0	7.0–10.75
Percent of standard length			
Head length	20.9	22.0	14.9–21.7
Predorsal length	53.3	55.5	—
Prepectoral length	21.8	22.3	—
Body depth (maximum)	3.7	3.2	—
Body depth at dorsal-fin origin	2.9	2.4	—
Tail depth	0.9	0.8	—
Percent of head length			
Snout length	61.8	59.0	50.0–66.7
Eye diameter (horizontal)	10.4	7.6	—
Eye diameter (vertical)	10.8	7.8	—
Snout depth at mouth	9.3	8.9	—
Snout depth at mid-way	7.1	7.3	—
Snout width at mouth	4.7	4.1	—
Snout width at mid-way	4.8	4.5	—
Dorsal-fin base length	60.0	51.7	55.6–100.0
Pectoral fin length	9.9	9.8	7.5–15.2
Percent of snout length			
Snout depth at mid-way	11.5	12.4	7.6–14.7

Discussion

Although the presence of *M. brachyurus lineatus* in Suriname was expected (e.g., van der Sleen and Albert 2018), the species was never reported from this country (Mol 2012a, Mol et al. 2012, NatureServe and Sparks 2017). Our record closes this gap in its distribution area.

The collection of 3 specimens within a single day may indicate that the species is indeed not rare, at least during certain times of the year and at certain localities in Suriname. In Florida, it is suspected that the species performs seasonal migrations into freshwater for spawning (Gilmore 1977). At the Overbridge locality on the Suriname River, and in the very same vegetation stands where *M. b. lineatus* was collected, we also found 4 specimens of a second freshwater pipefish, the small-sized, short-snouted *Pseudophallus brasiliensis*. Respective investigations on the ecology of *M. b. lineatus* from the tropics of South America are presently missing. Future studies should investigate the ecology and life history of *M. b. lineatus* from tropical areas and compare its ecological demands with the syntopically occurring *Pseudophallus brasiliensis* (Mol 2012b).

Acknowledgements

We thank Vivica von Vietinghoff for assistance with the field work and for taking pictures of the live specimens, and Peter Warth for assistance in field work. We thank Graham Short and Sancia van der Meij for helpful comments on the manuscript. The collection trip was financially supported in the project "Phylogeny of basal clupeocephalans" AZ-88 353 funded by the VolkswagenStiftung.

Authors' Contributions

TM, PT and KWTY collected the specimens; JM organized collection permits; TM and JM wrote the manuscript; PT made images of the vouchers and took measurements; KWTY provided information from keeping a specimen in an aquarium.

References

Dawson CE (1979) Review of the polytypic doryrhamphine pipefish *Oostethus brachyurus* (Bleeker). Bulletin of Marine Science 29: 465–480.

Dawson CE (1984) Revision of the genus *Microphis* Kaup (Pisces: Syngnathidae). Bulletin of Marine Science 35: 117–181.

Eigenmann CH (1912) The freshwater fishes of British Guiana, including a study of the ecological grouping of species and the relation of the fauna of the plateau to that of the lowlands. Memoirs of the Carnegie Museum 5: 1–578. https://doi.org/10.5962/bhl.title.4686

Ferraris CJ Jr (2003) Family Syngnathidae. In: Reis RE, Kullander SO, Ferraris CJ Jr (Eds) Check list of the freshwater fishes of South and Central America. Edipucrs, Porto Alegre, 591–593.

Fricke R, Eschmeyer WN, van der Laan R (2018) Catalog of Fishes: Genera, Species, References. http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp. Accessed on: 2018-11-3.

Gilmore RG (1977) Notes on the opossum pipefish, *Oostethus lineatus*, from the Indian River Lagoon and Vicinity, Florida. Copeia 1977: 781–783. https://doi.org/10.2307/1443192

NatureServe, Sparks JS (2017) *Microphis brachyurus*. The IUCN Red List of Threatened Species 2017: e.T181547A58325804. http://doi.org/10.2305/IUCN.UK.2017-2.RLTS.T181547A58325804.en. Accessed on: 2018-11-03. https://doi.org/10.2305/iucn.uk.2017-2.rlts.t181547a58325804.en

Mol JH (2012a) The freshwater fishes of Suriname. Koninklijke Brill NV, Leiden, 890 pp. https://doi.org/10.1163/9789004207653

Mol JH (2012b) Occurrence of a freshwater pipefish *Pseudophallus* cf. *brasiliensis* (Syngnathidae) in Corantijn River, Suriname, with notes on its distribution, habitat, and reproduction. Cybium 36: 45–53.

Mol JH, Vari RP, Covain R, Willink PW, Fisch-Muller S (2012) Annotated checklist of the freshwater fishes of Suriname. Cybium 36: 263–292.

van der Sleen P, Albert JS (2018) Family Syngnathidae – Pipefishes. In: van der Sleen P, Albert JS (Eds) Field guide to the fishes of the Amazon, Orinoco & Guianas. Princeton University Press, Princeton, 399–400. https://doi.org/10.1515/9781400888801